of amino acid sequence (a) is substituted with another amino acid sequence, the amino acid sequence (b) having the activity to biosynthesize theobromine using 7-methylxanthine as the substrate.

17. (New) A polypeptide consisting of an amino acid sequence exhibiting at least 90% of homology with an amino acid sequence defined by amino acid numbers from 1 to 378 shown in SEQ ID NO: 1 in a Sequence List.

18. (New) A gene encoding the polypeptide according to claim 16.

19. (New) A gene encoding the polypeptide claim 17.

20. (New) A gene consisting of a base sequence of following (c), (d) or (e):

(c) a base sequence defined by base numbers from 1 to 1298 shown in SEQ ID NO: 2 in a Sequence List,

(d) a base sequence in which a part of base sequence (c) is deleted or another base sequence is added to said base sequence (c) or a part of base sequence (c) is substituted with another base sequence, the base sequence (d) encoding a polypeptide having the activity to biosynthesize theobromine using 7-methylxanthine as the substrate,

(e) a base sequence that hybridizes with said base sequence (c) under stringent condition, the base sequence (e) encoding a polypeptide having the activity to biosynthesize theobromine using 7-methylxanthine as the substrate.

21. (New) A gene consisting of a base sequence exhibiting at least 90% of homology with a base sequence defined by base numbers from 1 to 1298 shown in SEQ ID NO: 2 in a Sequence List.

22. (New) A transformed plant wherein expression of the gene according to any one of Claims 18 to 20 is decreased in the plant to inhibit biosynthsis of theobromine.

23. (New) The transformed plant according to Claim 22, wherein antisense gene method is utilized to inhibit biosynthesis of theobromine.

24. (New) The transformed plant according to Claim 22, wherein said plant is selected from the group consisting of Coffea arabica, Coffea canephora, Coffea liberica and Coffea dewevrei.

25. (New) A seed obtained from the transformed plant according to claim 22.

26. (New) A seed obtained from the transformed plant according to claim 23.

27. (New) A seed obtained from the transformed plant according to claim 24.

28. (New) A transformed plant wherein gene according to any one of claims 18 to 20 is introduced in the plant to increase biosynthsis of theobromine.

29. (New) The transformed plant according to claim 28, wherein said plant is selected from the group consisting of Coffea arabica, Coffea canephora, Coffea liberica and Coffea dewevrei.

30. (New) A seed obtained from the transformed plant according to claim 28.

31. (New) A seed obtained from the transformed plant according to claim 29.

32. (New) A method for production of a transformed plant in which biosynthesis of theobromine is inhibited in the plant by decreasing expression of the gene according to Claims 18 or 20.

33. (New) The method according to Claim 32, wherein antisense gene method is utilized to inhibit biosynthesis of theobromine.

34. (New) A method for production of a transformed plant in which biosynthesis of theobromine is enhanced in the plant by enhancing expression of the gene according to Claims 18 or 20.